Las Vegas initial modeling analysis

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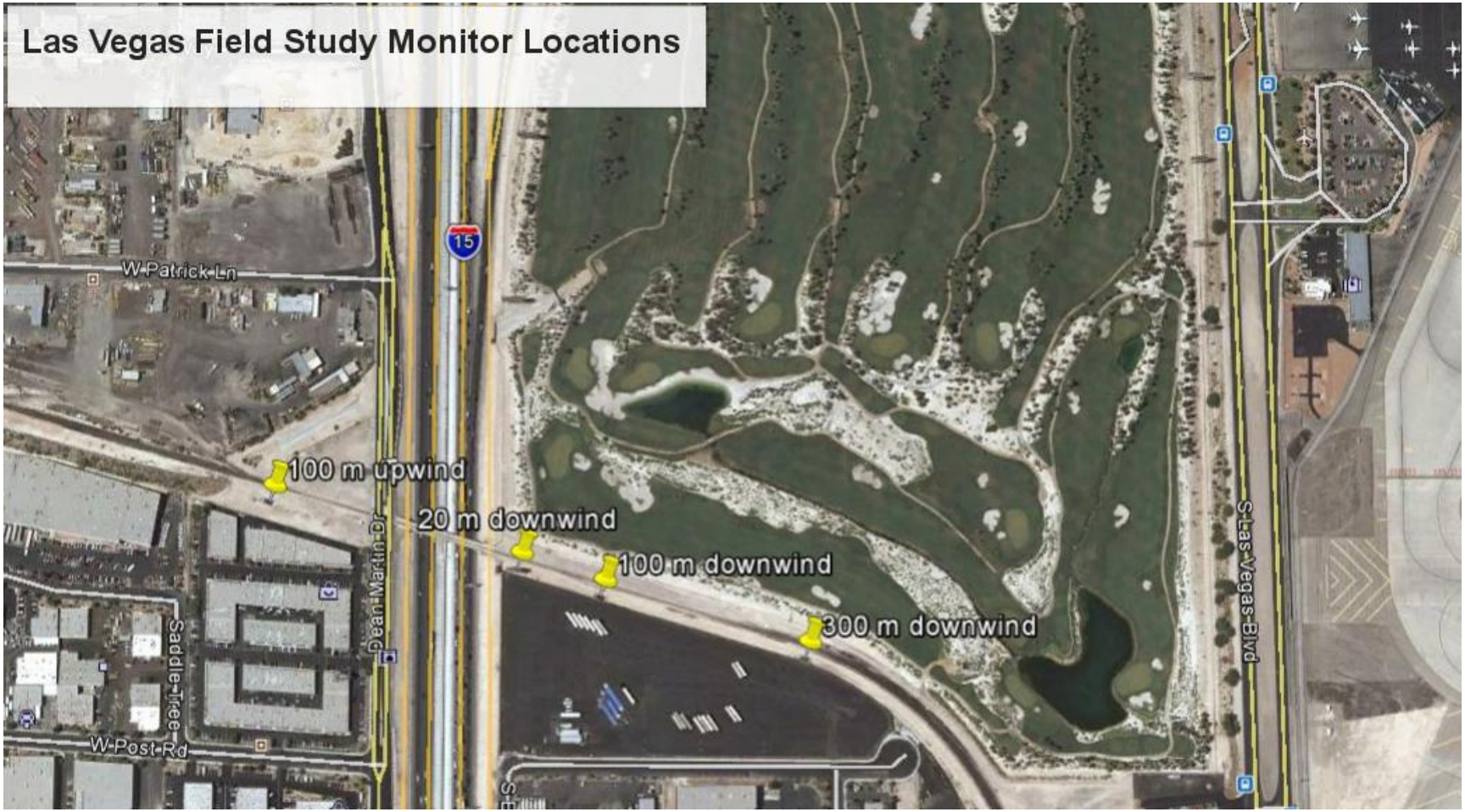
RSL meeting, New Orleans, LA

11/16/2016

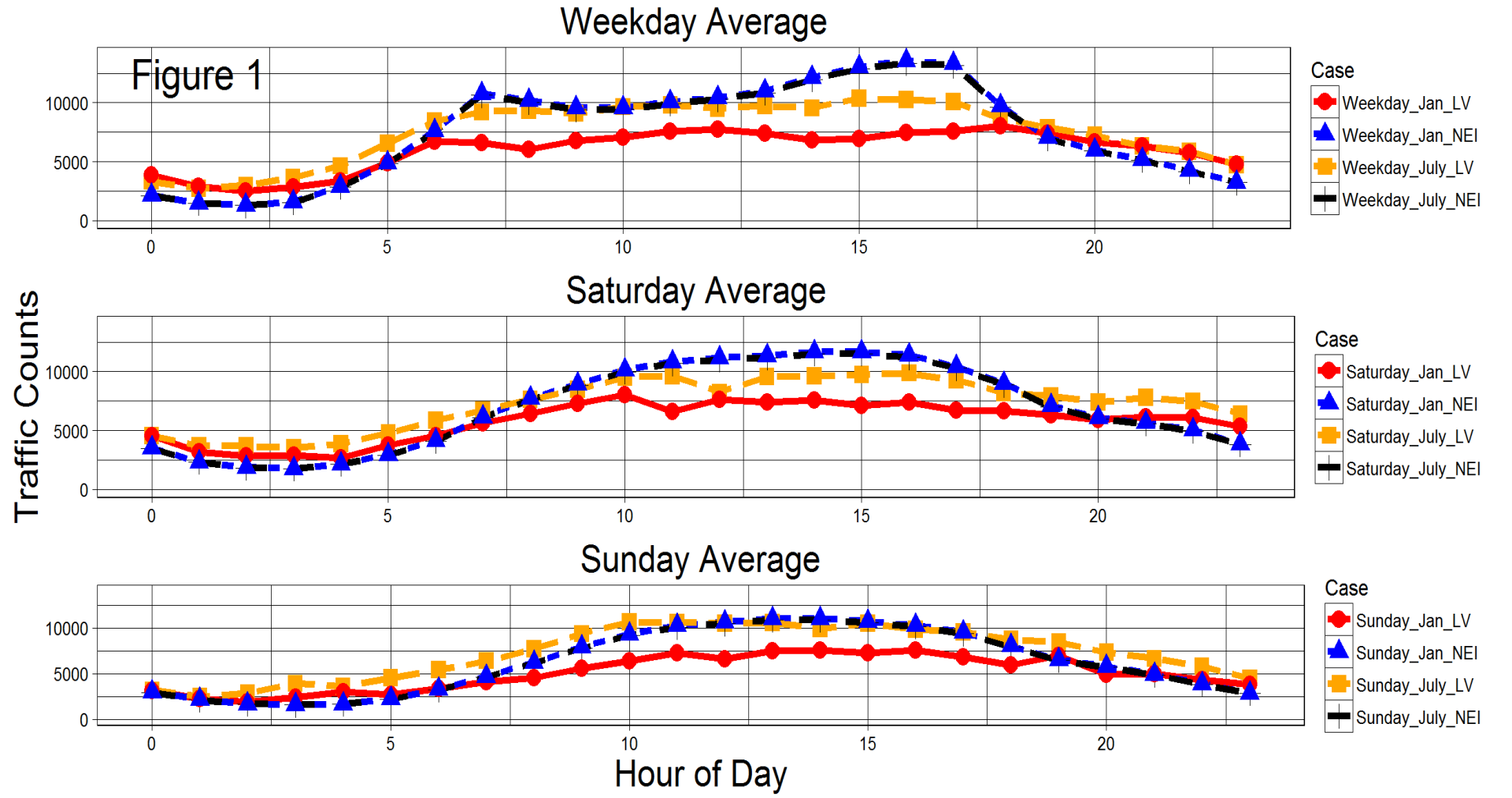
Field study location



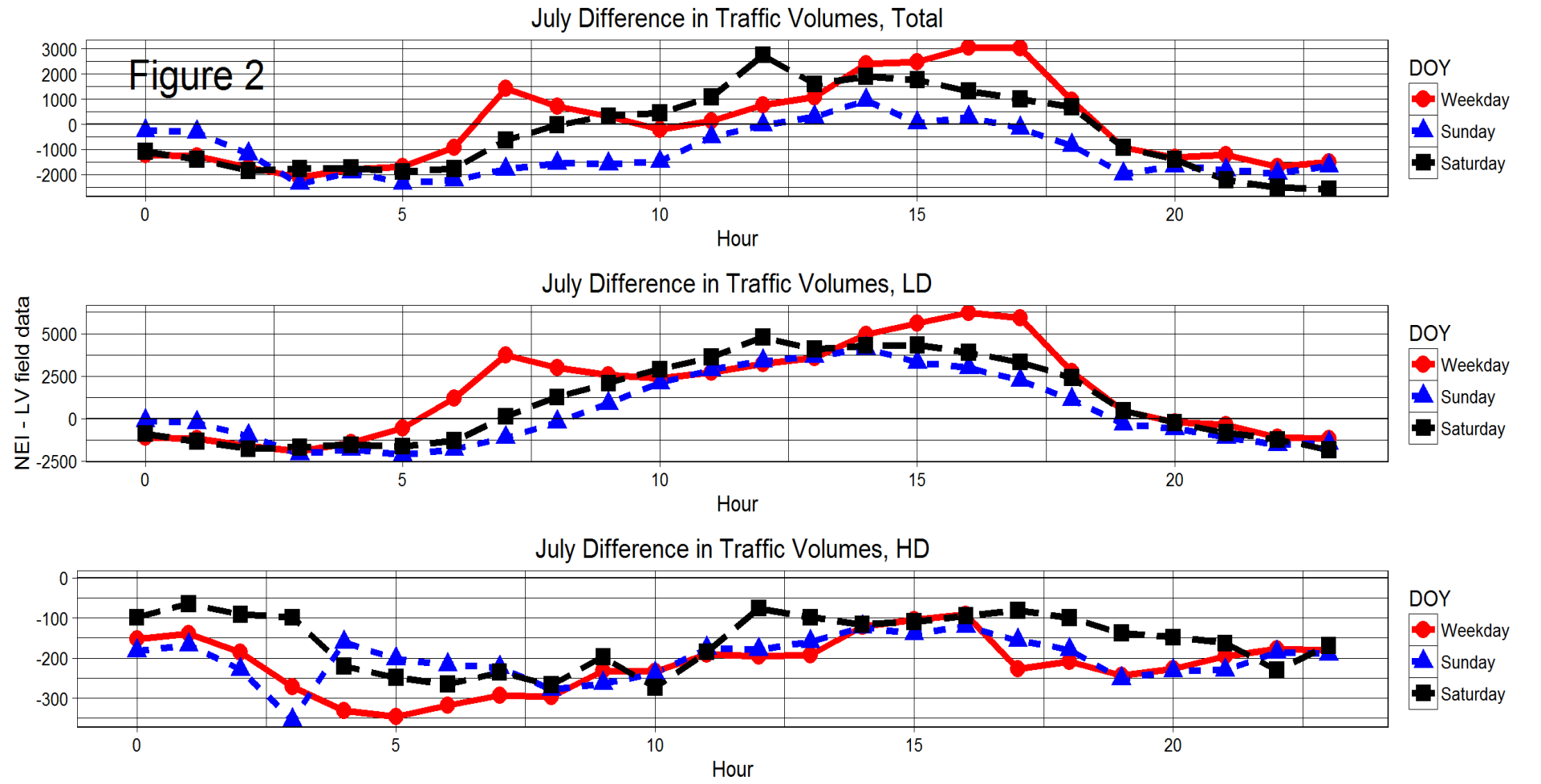
Traffic patterns: field vs modeled

- VMT near the traffic counter was estimated from the NEI2011v6.3 CMAQ modeling platform:
  - Monthly VMT data for year 2011 at the county-level.
  - VMT taken from 4km by 4km grid cell in for Clark County which included field study location
  - Temporal profiles extracted for each source and road type (e.g. passenger cars on rural roads).
  - Traffic count was estimated assuming about 1.4 miles of urban interstate was contained in the 4km grid cell (traffic count = 1.4 miles * VMT).
  - Estimate carried out for all vehicles and for heavy-duty-only vehicles in this 4km grid cell.

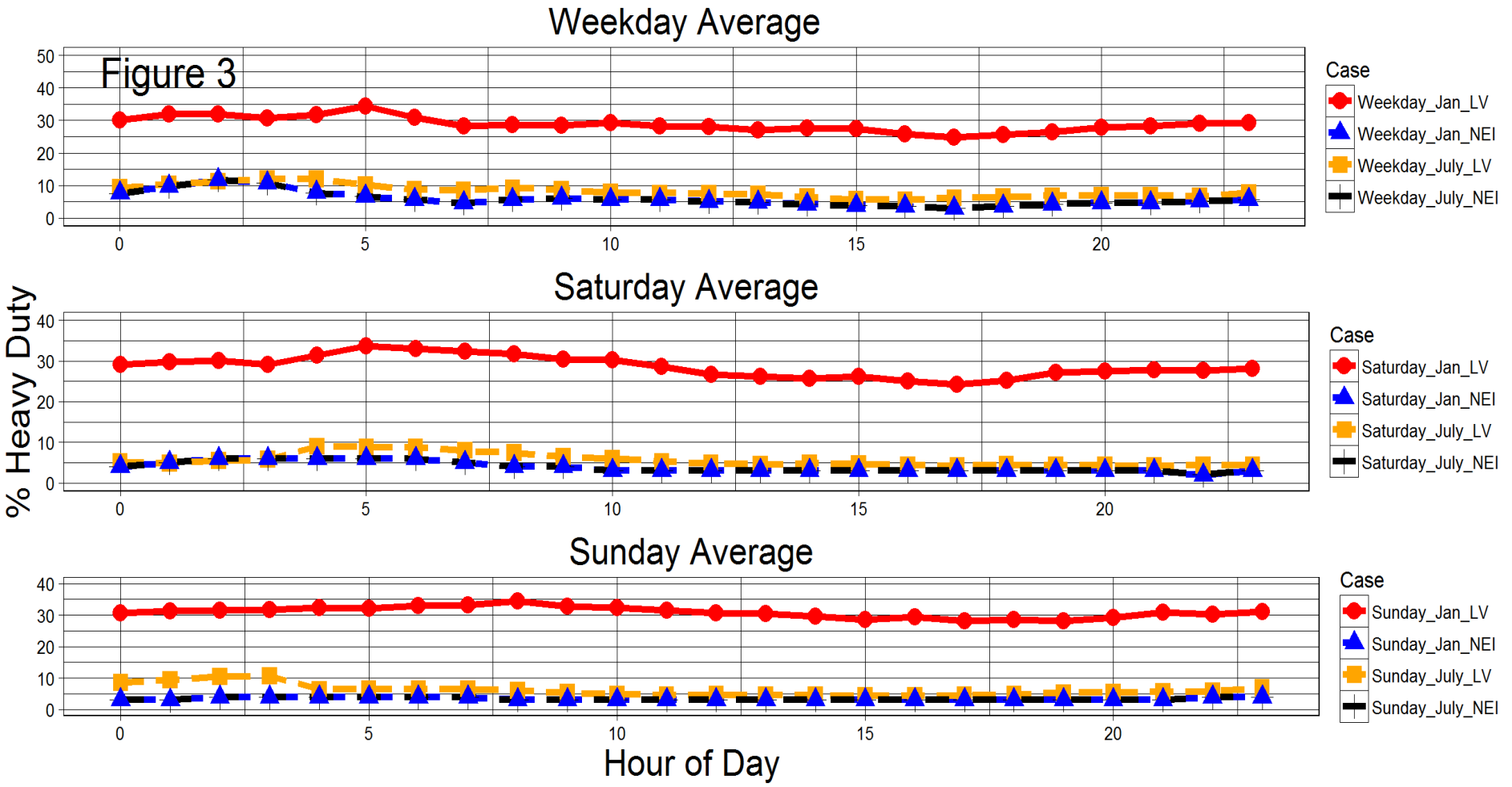
Traffic volumes



Delta traffic volumes



Percentage of heavy duty



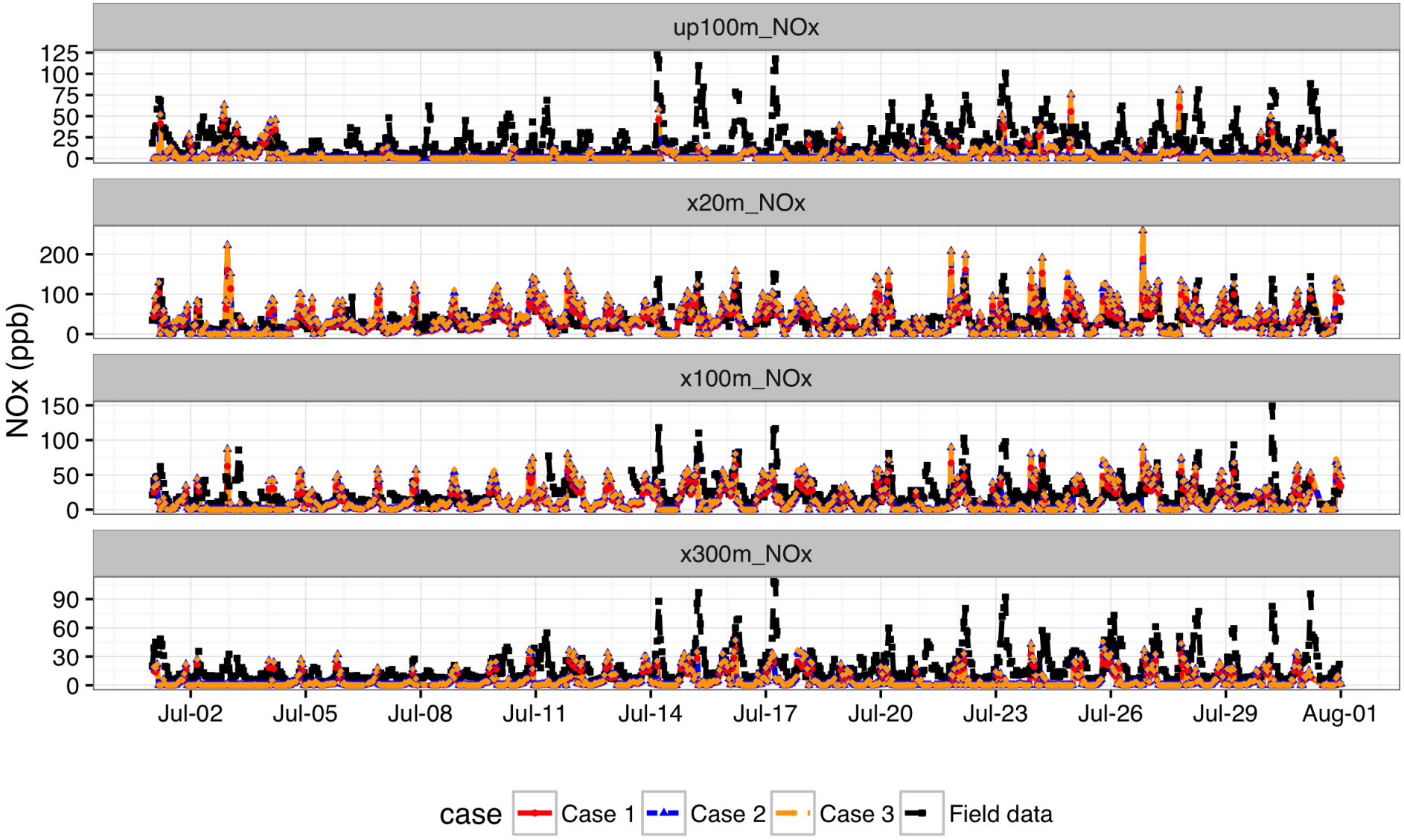
MOVES sensitivity cases

- The three scenarios were defined as follows, based on sensitivity testing of several input sets:
  - **Case 1**: MOVES2014a national defaults for vehicle mix, age distribution and drive schedules;
  - **Case 2**: Mix and age distribution estimated from a license plate capture study by UC Riverside on Las Vegas interstates in 2010. This study observed a younger car and light truck fleet than either national default or Clark County registration data, resulting in lower emissions.
  - **Case 3**: Default vehicle mix and age distribution data, but replaced MOVES default drive schedules with alternative drive schedules observed on an urban interstate with moderate-to-high congestion. These were constructed using publicly-available data from the US DOT FHWA Next Generation Simulation (NGSIM) program.

Model comparisons caveats

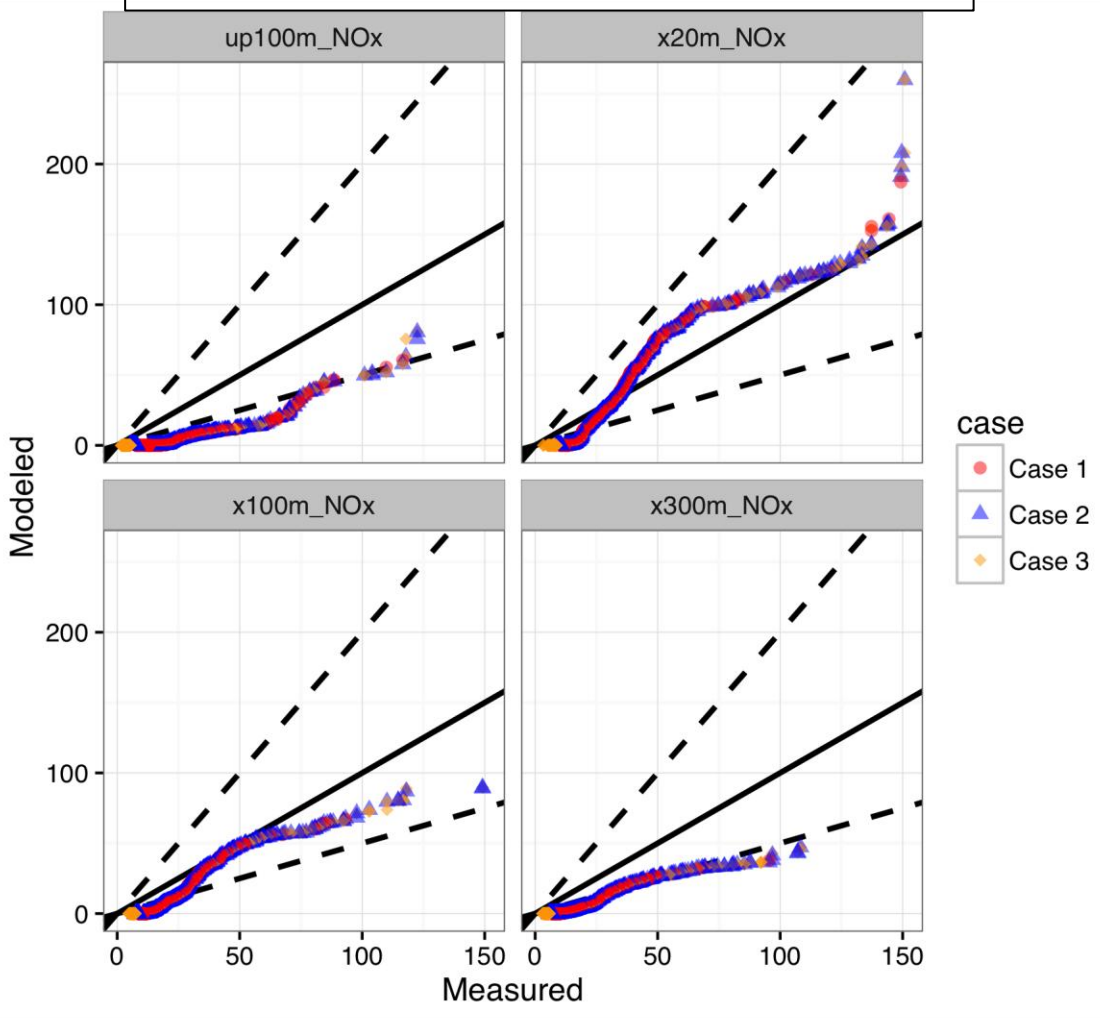
- Following figures have not considered:
  - Wind direction
    - No differentiation between upwind and downwind conditions
    - Includes “upwind” monitoring data
  - Background
    - Without the wind direction differentiation, we did not add background to modeled concentrations
    - All modeled values shown are thus lower than what they should be

NOx time series, July



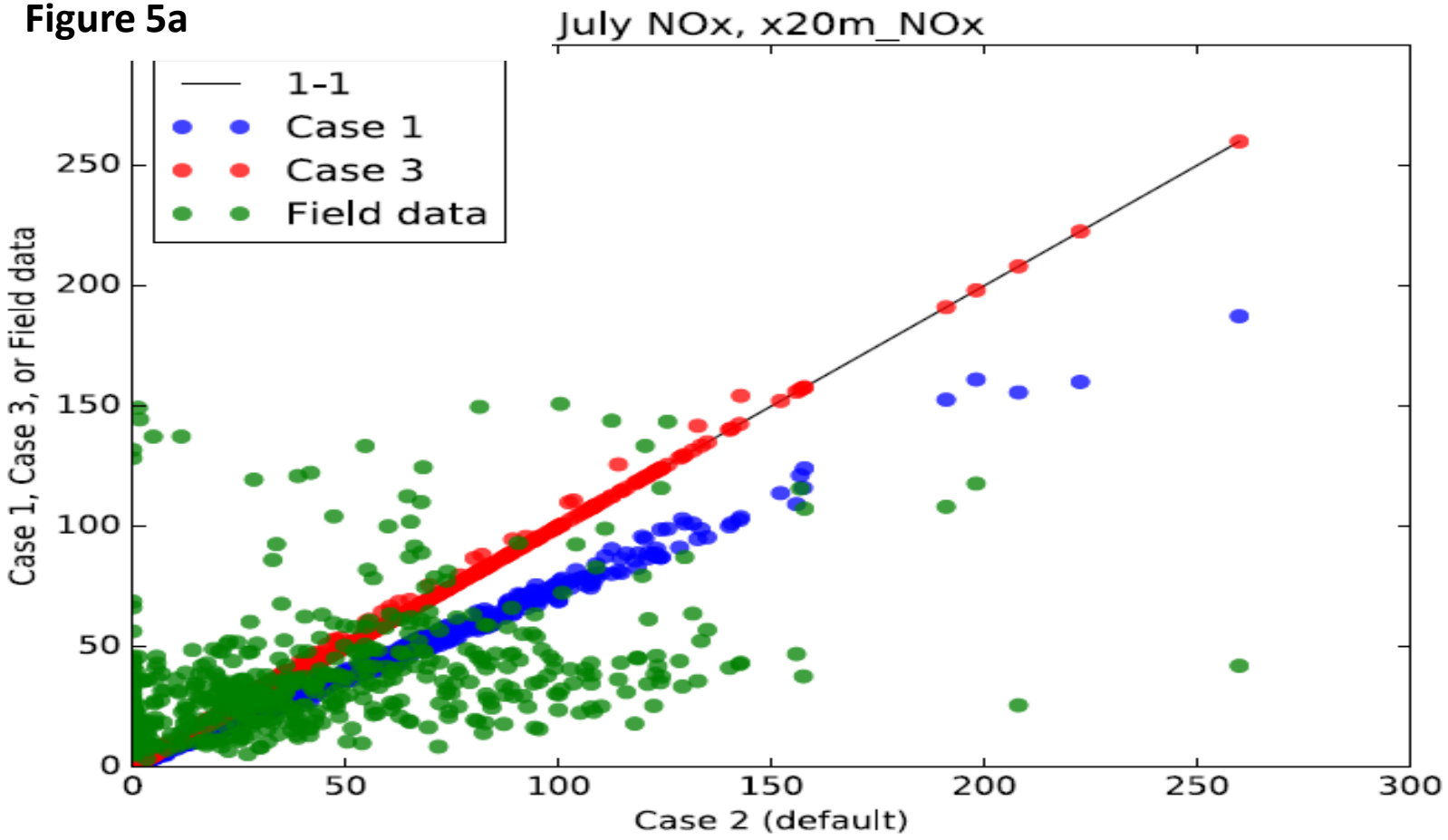
Modeled NOx - QQ

Figure 4a – NOx July Q-Q plot

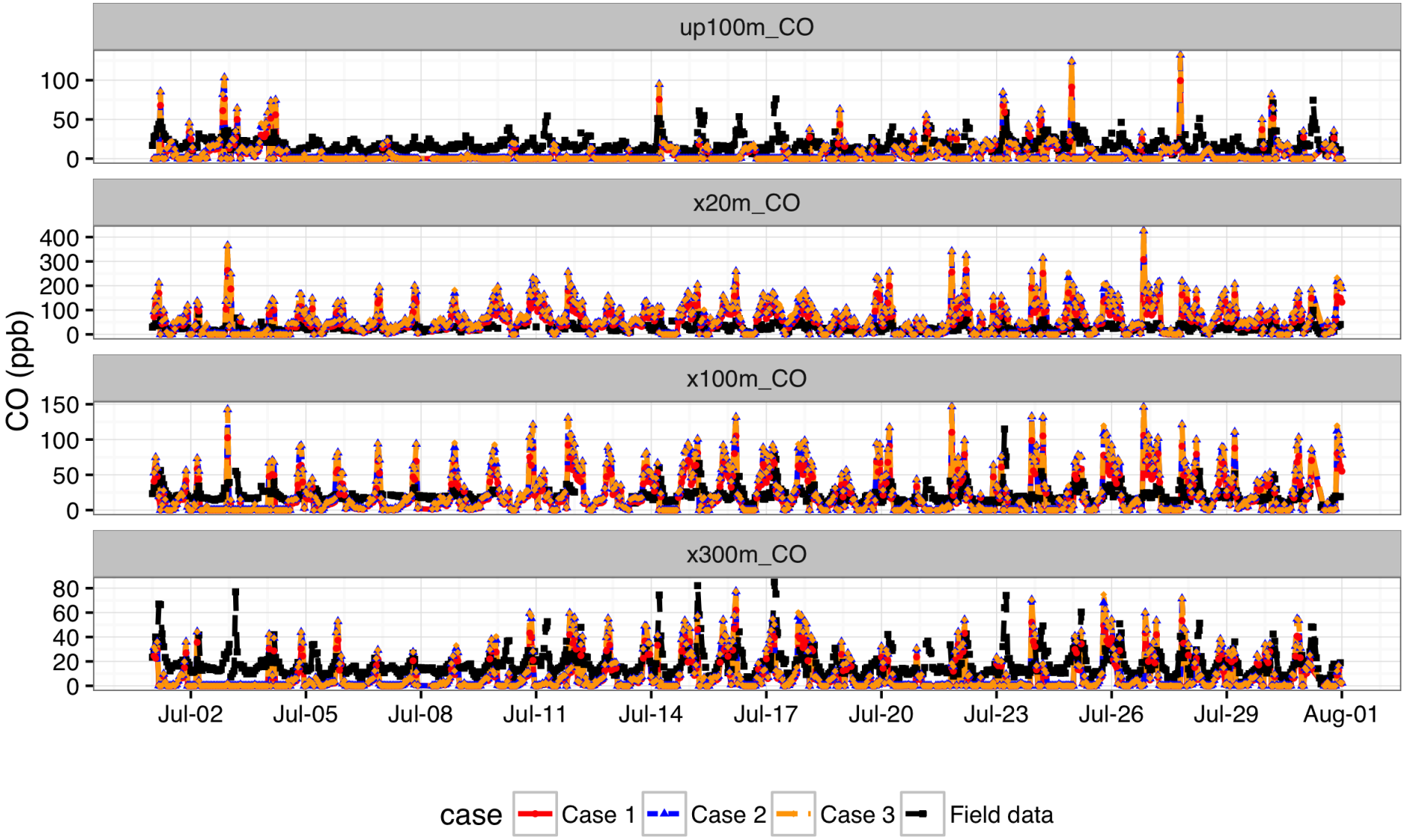


Modeled NOx – scatter, 20 m

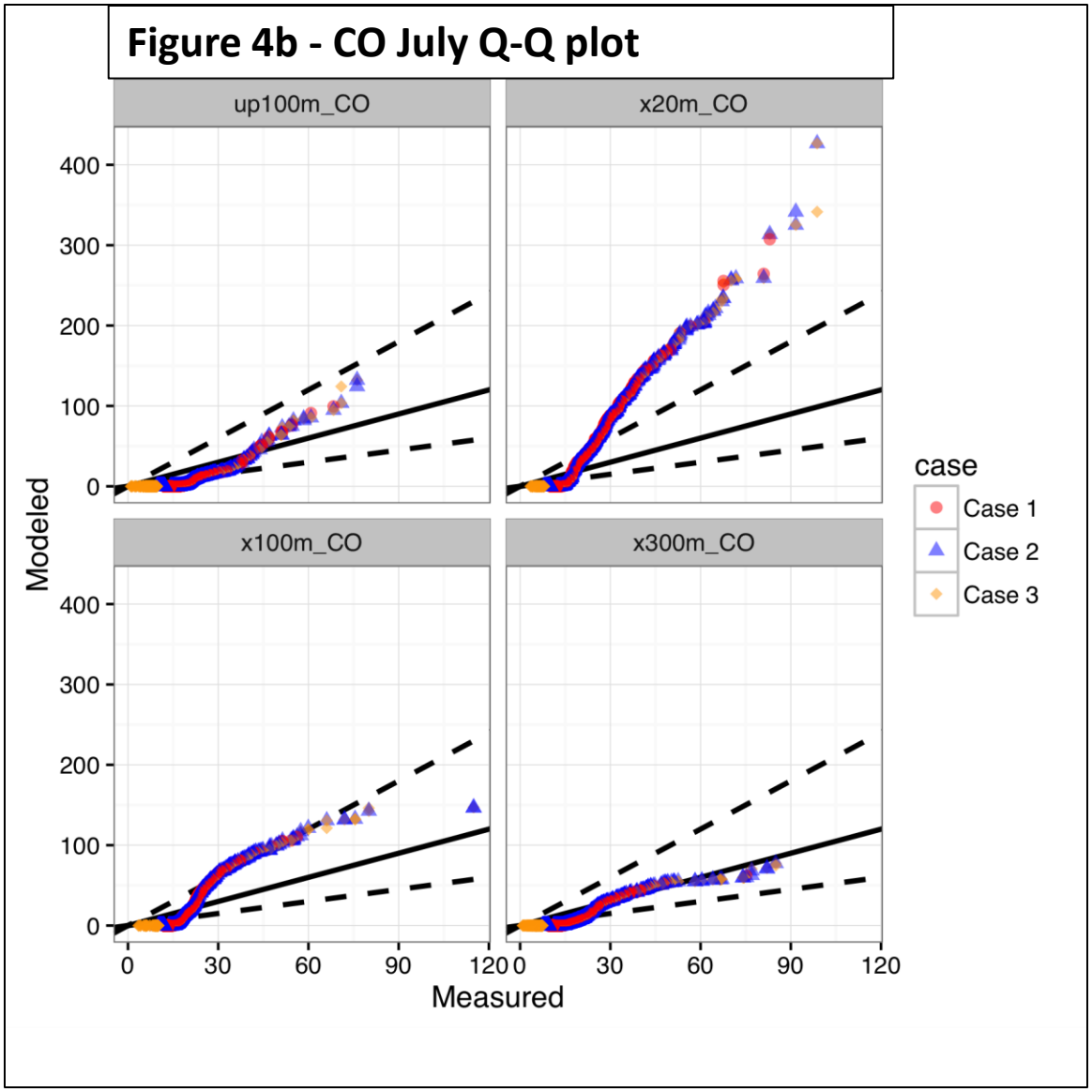
Figure 5a



CO time series, July



Modeled CO - QQ



Modeled CO – scatter, 20 m

Figure 5b